



DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RTID 0648- XA815

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Naval Base San Diego Pier 6 Replacement Project, San Diego, California

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of an incidental harassment authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued an incidental harassment authorization (IHA) to the U.S. Navy (Navy) to incidentally harass, by Level B harassment only, marine mammals during activities associated with the Naval Base San Diego Pier 6 Replacement Project in San Diego, California.

DATES: This Authorization is effective from October 1, 2021 through September 30, 2022.

FOR FURTHER INFORMATION CONTACT: Dwayne Meadows, Ph.D., Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: <https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act>. In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the “take” of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed incidental take authorization may be provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other “means of effecting the least practicable adverse impact” on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to in shorthand as “mitigation”); and requirements pertaining to the mitigation, monitoring and reporting of the takings are set forth.

The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

Summary of Request

On July 14, 2020, NMFS received an application from the Navy requesting an IHA to take small numbers of California sea lions incidental to pile driving and removal associated with the Naval Base San Diego Pier 6 Replacement Project. The application was deemed adequate and complete on November 25, 2020. The Navy’s request is for take of a small number of California sea lions by Level B harassment. Neither the Navy

nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Proposed Activity

Overview

The purpose of the project is to remove and replace a decaying and inadequate pier for Navy ships. Specifically, in-water construction work includes removing the existing pier (by vibratory pile extraction, water jetting, hydraulic underwater chainsaw, direct pulling, and/or pile clippers) consisting of a total of 1,998 12 to 24-inch piles, after removing above water structures and utilities. Once demolition has opened up space, construction will begin in the same location on a new pier measuring 37 meters (m) (120 feet (ft)) wide by 457 m (1,500 ft) long. New construction work involves impact driving of 966 piles. This includes 528 24-inch structural concrete piles, 208 24-inch concrete fender piles, 4 20-inch piles for a load-out ramp, and 226 16-inch fiberglass secondary and corner fender piles. Pile driving/removal is expected to take no more than 250 days. Pile driving would be by vibratory pile driving until resistance is too great and driving would switch to an impact hammer.

A detailed description of the planned project is provided in the **Federal Register** notice for the proposed IHA (85 FR 80027; December 11, 2020). Since that time, no changes have been made to the planned activities. Therefore, a detailed description is not provided here. Please refer to that **Federal Register** notice for the description of the specific activity.

Comments and Response

A notice of NMFS's proposal to issue an IHA to the Navy was published in the **Federal Register** on December 11, 2020 (85 FR 80027). That notice described, in detail, the Navy's activity, the marine mammal species that may be affected by the activity, and the anticipated effects on marine mammals. During the 30-day public

comment period, NMFS received no public comment or comment letter from the Marine Mammal Commission.

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history, of the potentially affected species. Additional information regarding population trends and threats may be found in NMFS's Stock Assessment Reports (SARs; <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS's website (<https://www.fisheries.noaa.gov/find-species>).

Table 1 lists all species with expected potential for occurrence in the project area in San Diego Bay and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2020). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS's SARs). While no mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S.

waters. All managed stocks in this region are assessed in NMFS's U.S. Pacific SARs

(e.g., Caretta *et al.*, 2020).

Table 1. Species That Spatially Co-occur with the Activity to the Degree That Take Is Reasonably Likely to Occur

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N) ¹	Stock abundance (CV, N _{min} , most recent abundance survey) ²	PBR	Annual M/SI ³
Order Carnivora – Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions)						
California Sea Lion	<i>Zalophus californianus</i>	United States	-, -, N	257,606 (N/A, 233,515, 2014)	14,011	>321

1 - Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

2- NMFS marine mammal stock assessment reports online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance.

3 - These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (e.g., commercial fisheries, ship strike). Annual Mortality/ Serious Injury (M/SI) often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.

California sea lions (*Zalophus californianus*) spatially co-occur with the activity to the degree that take is reasonably likely to occur, and we are authorizing take of this species. Other marine mammal species observed in San Diego Bay are the coastal bottlenose dolphin (*Tursiops truncatus*), which is regularly seen in the North Bay; Pacific harbor seal (*Phoca vitulina*), which frequently enters the North Bay; and common dolphins (*Delphinus* spp.), which are rare visitors in the North Bay. Gray whales (*Eschrichtius robustus*) are occasionally sighted near the mouth of San Diego Bay during their winter migration (Naval Facilities Engineering Command, Southwest and Port of San Diego Bay, 2013). Based on many years of observations and numerous Navy-funded surveys in San Diego Bay (Merkel and Associates, Inc., 2008; Sorensen and Swope, 2010; Graham and Saunders, 2014; Tierra Data Inc., 2016), these other marine mammals rarely occur south of the Coronado Bay Bridge, are not known to occur near Naval Base San Diego, and any occurrence in the project area would be very rare. Therefore, while

coastal bottlenose dolphins, Pacific harbor seals, common dolphins, and gray whales have been reported in San Diego Bay, they are not anticipated to occur in the project area and no take of these species is anticipated or authorized.

A detailed description of the of the species likely to be affected by the Navy's project, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the **Federal Register** notice for the proposed IHA (85 FR 80027; December 11, 2020); since that time, we are not aware of any changes in the status of these species and stocks; therefore, detailed descriptions are not provided here. Please refer to that **Federal Register** notice for these descriptions. Please also refer to NMFS' website (<https://www.fisheries.noaa.gov/find-species>) for generalized species accounts.

Potential Effects of Specified Activities on Marine Mammals and their Habitat

The effects of underwater noise from the Navy's construction activities have the potential to result in behavioral harassment of marine mammals in the vicinity of the survey area. The notice of proposed IHA (85 FR 80027; December 11, 2020) included a discussion of the effects of anthropogenic noise on marine mammals and the potential effects of underwater noise from the Navy's construction activities on marine mammals and their habitat. That information and analysis is incorporated by reference into this final IHA determination and is not repeated here; please refer to the notice of proposed IHA (85 FR 80027; December 11, 2020).

Estimated Take

This section provides an estimate of the number of incidental takes authorized through this IHA, which will inform both NMFS' consideration of "small numbers" and the negligible impact determination.

Harassment is the only type of take expected to result from these activities.

Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines “harassment” as any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes would be by Level B harassment, as use of the acoustic source (*i.e.*, vibratory or impact pile driving) has the potential to result in disruption of behavioral patterns for individual marine mammals. Based on the nature of the activity and the anticipated effectiveness of the mitigation measures (*i.e.*, shutdown) – discussed in detail below in **Mitigation** section, Level A harassment is neither anticipated nor authorized.

As described previously, no mortality is anticipated or authorized for this activity. Below we describe how the take is estimated.

Generally speaking, we estimate take by considering: (1) acoustic thresholds above which marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) the number of days of activities. We note that while these basic factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.*, previous monitoring results or average group size). Due to the lack of marine mammal density, NMFS relied on local occurrence data and group size to estimate take. Below, we describe the factors considered here in more detail and present

the take estimate.

Acoustic Thresholds

NMFS recommends the use of acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur Permanent Threshold Shift (PTS) of some degree (equated to Level A harassment).

Level B Harassment for non-explosive sources – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.*, frequency, predictability, duty cycle), the environment (*e.g.*, bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.*, 2007, Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 decibel (dB) re 1 microPascal (μPa) (root mean square (rms)) for continuous (*e.g.*, vibratory pile-driving) and above 160 dB re 1 μPa (rms) for non-explosive impulsive (*e.g.*, impact pile driving) or intermittent (*e.g.*, scientific sonar) sources.

The Navy's proposed activity includes the use of continuous (vibratory pile-driving, water jetting, chainsaw and pile clippers) and impulsive (impact pile-driving) sources, and therefore the 120 and 160 dB re 1 μPa (rms) thresholds are applicable. However, as discussed above, the Navy has established that the ambient noise in the project area is 126 dB re 1 μPa (rms). Since this is louder than the 120 dB threshold for

continuous sources, 126 dB becomes the effective threshold for Level B harassment for continuous sources.

Level A harassment for non-explosive sources - NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). The Navy's activity includes the use of impulsive (impact pile-driving) and non-impulsive (vibratory pile driving/removal and other removal methods) sources.

These thresholds are provided in Table 2. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2018 Technical Guidance, which may be accessed at

<https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance>.

Table 2. Thresholds Identifying the Onset of Permanent Threshold Shift

	PTS Onset Acoustic Thresholds* (Received Level)	
Hearing Group	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	<i>Cell 1</i> $L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	<i>Cell 2</i> $L_{E,LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	<i>Cell 3</i> $L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	<i>Cell 4</i> $L_{E,MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	<i>Cell 5</i> $L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	<i>Cell 6</i> $L_{E,HF,24h}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	<i>Cell 7</i> $L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	<i>Cell 8</i> $L_{E,PW,24h}$: 201 dB
Otariid Pinnipeds (OW) (Underwater)	<i>Cell 9</i> $L_{pk,flat}$: 232 dB $L_{E,OW,24h}$: 203 dB	<i>Cell 10</i> $L_{E,OW,24h}$: 219 dB

* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.

Note: Peak sound pressure (L_{pk}) has a reference value of 1 μPa , and cumulative sound exposure level (L_E) has a reference value of 1 $\mu\text{Pa}^2\text{s}$. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript “flat” is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (*i.e.*, varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that will feed into identifying the area ensonified above the acoustic thresholds, which include source levels and transmission loss coefficient.

The sound field in the project area is the existing background noise plus additional construction noise from the proposed project. Marine mammals are expected to be affected via sound generated by the primary components of the project (*i.e.*, impact pile driving, vibratory pile removal, water jetting, pile clippers and underwater chainsaws).

Vibratory hammers produce constant sound when operating, and produce vibrations that liquefy the sediment surrounding the pile, allowing it to penetrate to the required seating depth or be withdrawn more easily. An impact hammer is a steel device that works like a piston, producing a series of independent strikes to drive the pile. Impact hammering typically generates the loudest noise associated with pile installation. The actual durations of each installation method vary depending on the type and size of the pile.

In order to calculate distances to the Level A harassment and Level B harassment sound thresholds for piles of various sizes being used in this project, NMFS used acoustic monitoring data from other locations to develop source levels for the various pile types,

sizes and methods (see Table 3). Data for the removal methods including water jetting, pile clippers and underwater chainsaws come from data gathered at other nearby Navy projects in San Diego Bay (NAVFAC SW, 2020), the source levels used are from the averages of the maximum source levels measured, a somewhat more conservative measure than the median sound levels we typically use.

Table 3. Project Sound Source Levels

Pile Driving Activity		Estimated sound source level at 10 meters without attenuation			Data Source and Proxy
Method	Pile Type	dB RMS	dB SEL	dB peak	
Vibratory Extraction	12-inch timber/plastic	152			Greenbusch Group (2018)
	20 and 24-inch concrete	160			Caltrans (2015), Table I.2-2, 24-inch steel sheet
	16-inch steel	160			Caltrans (2015), Table I.2-2, 24-inch steel sheet
Water Jetting	20-inch concrete	158			NAVFAC SW (2020), 24 x 30-inch concrete
Underwater Chainsaw	12 to 24-inch concrete	150			NAVFAC SW (2020), 16-inch concrete*
Small Pile Clipper	12-inch timber/plastic	154			NAVFAC SW (2020), 13-inch polycarbonate
Large Pile Clipper	20-inch concrete	161			NAVFAC SW (2020), 24-inch concrete
Impact Hammer	20 and 24-inch concrete	176	166	188	Caltrans (2015), Table I.2-1, 24-inch concrete
	16-inch fiberglass	153	144**	177**	Caltrans (2015), 13-inch plastic

Note: SEL = single strike sound exposure level; dB peak = peak sound level; rms = root mean square.

*Source level was 147 dB at 17m from source, back calculated to 150dB using transmission loss coefficient of 15.

** Average of the peak values was 166 and that value was used in modelling in Dell'Osto and Dahl (2019) rather than the absolute peak we recommend for use in the user spreadsheet, SEL calculated from assumed strike rate in Dell'Osto and Dahl (2019).

During pile driving installation activities, there may be times when two pile extraction methods (pile clippers, water jetting, underwater chainsaws or vibratory pile removal) are used simultaneously. The likelihood of such an occurrence is anticipated to be infrequent, will depend on the specific methods chosen by the contractor, and would be for short durations on that day. In-water pile removal occurs intermittently, and it is common for removal to start and stop multiple times as each pile is adjusted and its progress is measured. Moreover, the Navy has multiple options for pile removal depending on the pile type and condition, sediment, and how stuck the pile is, etc. When two continuous noise sources, such as pile clippers, have overlapping sound fields, there is potential for higher sound levels than for non-overlapping sources. When two or more pile removal methods (pile clippers, water jetting, underwater chainsaws or vibratory pile removal) are used simultaneously, and the sound field of one source encompasses the sound field of another source, the sources are considered additive and combined using the following rules (see Table 4): for addition of two simultaneous methods, the difference between the two sound source levels (SSLs) is calculated, and if that difference is between 0 and 1 dB, 3 dB are added to the higher SSL; if difference is between 2 or 3 dB, 2 dB are added to the highest SSL; if the difference is between 4 to 9 dB, 1 dB is added to the highest SSL; and with differences of 10 or more dB, there is no addition (NMFS 2018b; WSDOT 2018).

Table 4. Rules for Combining Sound Levels Generated During Pile Removal

Difference in SSL	Level A Zones	Level B Zones
0 or 1 dB	Add 3 dB to the higher source level	Add 3 dB to the higher source level
2 or 3 dB	Add 2 dB to the higher source level	Add 2 dB to the higher source level
4 to 9 dB	Add 1 dB to the higher source level	Add 1 dB to the higher source level
10 dB or more	Add 0 dB to the higher source level	Add 0 dB to the higher source level

There is also the possibility that impact installation of piles could happen simultaneously with any of the non-impulsive removal methods over large portions of the project as described above. On days when this occurs the Level A harassment zones would be based on the zones calculated for impact pile driving while the Level B harassment zone would be the largest of the zones for whatever construction methods are being used that day.

Level B Harassment Zones

Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

$$TL = B * \text{Log}_{10} (R1/R2), \text{ where}$$

TL = transmission loss in dB

B = transmission loss coefficient; for practical spreading equals 15

R1 = the distance of the modeled SPL from the driven pile, and

R2 = the distance from the driven pile of the initial measurement

The recommended TL coefficient for most nearshore environments is the practical spreading value of 15. This value results in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions, which is the most appropriate assumption for the Navy's proposed activity in the absence of specific modelling. For this project however, the Navy did model sound propagation for the impact and vibratory hammering methods (Dall'Osto and Dahl 2019). For all other pile removal methods we used the practical spreading value.

The Navy determined underwater noise would fall below the behavioral effects threshold of 126 dB rms for marine mammals at distances of less than 10 to 7,140 m depending on the pile type(s) and methods (Table 5). It should be noted that based on the bathymetry and geography of San Diego Bay, sound will not reach the full distance of the Level B harassment isopleths in all directions. Because the Navy's as yet unhired contractor has not decided which of the various pile removal methods it will use, we only calculate a worst-case scenario of simultaneous operation of two of the loudest sound producing methods (large pile clippers) to consider the largest possible harassment zones for simultaneous pile removal.

Table 5. Level A and Level B Isopleths for Each Pile Driving Type and Method

Pile Driving Activity		Radial Distance or Maximum Modeled Length x Width (m)	
Method	Pile Type	Level A	Level B
Vibratory Extraction	12-inch timber/plastic	<10	2167 x 1065
	20 and 24-inch concrete	<10	6,990 x 1,173
	16-inch steel	<10	7,140 x 1,595
Water Jetting	20-inch concrete	<10	1359
Underwater Chainsaw	12 to 24-inch concrete	<10	398
Small Pile Clipper	12-inch timber/plastic	<10	736
Large Pile Clipper	20 to 24-inch concrete	<10	2154
Two Large Pile Clippers	20 to 24-inch concrete	<10	3415
Impact Hammer	20 and 24-inch concrete	<10	192
	16-inch fiberglass	<10	<10

Level A Harassment Zones

When the NMFS Technical Guidance (2016) was published, in recognition of the fact that ensonified area/volume could be more technically challenging to predict because of the duration component in the new thresholds, we developed a User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to help predict takes. We note that because of some of the assumptions included in the methods used for these tools, we anticipate that isopleths produced are typically going to be overestimates of some degree, which may result in some degree of overestimate of take by Level A harassment. However, these tools offer the best way to predict appropriate isopleths when more sophisticated 3D modeling methods are not available, and NMFS continues to develop ways to quantitatively refine these tools, and will qualitatively address the output where appropriate. For stationary sources such as impact/vibratory pile driving or removal using any of the methods discussed above, NMFS User Spreadsheet predicts the closest distance at which, if a marine mammal remained at that distance the whole duration of the activity, it would not incur PTS.

As discussed above, the Navy modelled sound propagation for impact and vibratory hammering of piles (Dall'Osto and Dahl 2019) and used those models to calculate Level A harassment isopleths. For all other pile removal methods we used the User Spreadsheet to determine the Level A harassment isopleths. Inputs used in the User Spreadsheet or models are reported in Table 6 and the resulting isopleths are reported in Table 6 for each of construction methods.

Table 6. NMFS Technical Guidance User Spreadsheet Input to Calculate Level A Isopleths for a Combination of Pile Driving

Pile Driving Activity		Radial Distance or Maximum Modeled Length x Width (m)	
Method	Pile Type	Piles per day	Strikes per Pile/ Duration

			to drive a single pile
Vibratory Extraction	12-inch timber/plastic	8	10 min
	20 and 24-inch concrete	8	10 min
	16-inch steel	8	10 min
Water Jetting	20-inch concrete	8	20 min
Underwater Chainsaw	12 to 24-inch concrete	8	10 min
Small Pile Clipper	12-inch timber/plastic	8	10 min
Large Pile Clipper	20-inch concrete	8	10 min
Impact Hammer	20 and 24-inch concrete	7	600 strikes
	16-inch fiberglass	7	600 strikes

The above input scenarios lead to PTS isopleth distances (Level A thresholds) of less than 10 m for all methods and piles (Table 5).

Marine Mammal Occurrence and Take Calculation and Estimation

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations. Here we describe how the information provided above is brought together to produce a quantitative take estimate.

No California sea lion density information is available for south San Diego Bay. Potential exposures to impact and vibratory pile driving noise for each threshold for California sea lions were estimated using data collected during a 2010 survey as reported in Sorensen and Swope (2010). During this survey two separate sea lions were observed in the project area.

The available survey data from Sorenson and Swope (2010) and other unpublished monitoring data from recent nearby projects on Naval Base San Diego suggests two California sea lions could be present each day in the project area. However

given the limited data available and the more northerly location of this project relative to the recent dry dock project (<https://www.fisheries.noaa.gov/action/incidental-take-authorization-us-navy-floating-dry-dock-project-naval-base-san-diego>) where we estimate two California sea lions per day, to be conservative, we have estimated four California sea lions could be present each day. As noted above, there are 250 days of in-water work for this project. Multiplication of the above estimate of animals per day (4) times the days of work (250) results in a Level B harassment take of 1000 California sea lions (Table 7). The Navy intends to avoid Level A harassment take by shutting down activities if a California sea lion approaches within 20 m of the project site, which encompasses all Level A harassment ensouification zones. Therefore, no take by Level A harassment is anticipated or authorized.

Table 7. Authorized Amount of Taking, by Level A Harassment and Level B Harassment, by Species and Stock and Percent of Take by Stock

Species	Authorized Take		Percent of Stock
	Level B	Level A	
California sea lion (<i>Zalophus californianus</i>) U.S. Stock	1000	0	0.4

Mitigation

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting the activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully consider two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned); and

(2) The practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

The following mitigation measures are in the IHA:

- For in-water heavy machinery work other than pile driving, if a marine mammal comes within 10 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions. This type of work could include the following activities: (1) Movement of the barge to the pile location; or (2) positioning of the pile on the substrate via a crane (*i.e.*, stabbing the pile);
- Conduct briefings between construction supervisors and crews and the marine mammal monitoring team prior to the start of all pile driving activity and when new personnel join the work, to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures;

- For those marine mammals for which Level B harassment take has not been requested, in-water pile installation/removal will shut down immediately if such species are observed within or entering the Level B harassment zone; and

- If take reaches the authorized limit for an authorized species, pile installation will be stopped as these species approach the Level B harassment zone to avoid additional take.

The following mitigation measures would apply to the Navy's in-water construction activities.

- *Establishment of Shutdown Zones*- The Navy will establish shutdown zones for all pile driving and removal activities. The purpose of a shutdown zone is generally to define an area within which shutdown of the activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). Shutdown zones typically vary based on the activity type and marine mammal hearing group (Table 4). In this case there is only one species affected and all level A harassment isopleths are less than 10 m radius. To be conservative, the Navy will establish a 20 m shutdown zone for all pile driving or removal activities.

- The placement of Protected Species Observers (PSOs) during all pile driving and removal activities (described in detail in the **Monitoring and Reporting** section) will ensure that the entire shutdown zone is visible during pile installation. Should environmental conditions deteriorate such that marine mammals within the entire shutdown zone would not be visible (*e.g.*, fog, heavy rain), pile driving and removal must be delayed until the PSO is confident marine mammals within the shutdown zone could be detected.

- *Monitoring for Level B Harassment*- The Navy will monitor the Level A and B harassment zones. Monitoring zones provide utility for observing by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring zones enable

observers to be aware of and communicate the presence of marine mammals in the project area outside the shutdown zone and thus prepare for a potential halt of activity should the animal enter the shutdown zone. Placement of PSOs will allow PSOs to observe marine mammals within the Level B harassment zones.

- *Pre-activity Monitoring-* Prior to the start of daily in-water construction activity, or whenever a break in pile driving/removal of 30 minutes or longer occurs, PSOs will observe the shutdown and monitoring zones for a period of 30 minutes. The shutdown zone will be considered cleared when a marine mammal has not been observed within the zone for that 30-minute period. If a marine mammal is observed within the shutdown zone, a soft-start cannot proceed until the animal has left the zone or has not been observed for 15 minutes. When a marine mammal for which Level B harassment take is authorized is present in the Level B harassment zone, activities may begin and Level B harassment take will be recorded. If the entire Level B harassment zone is not visible at the start of construction, pile driving activities can begin. If work ceases for more than 30 minutes, the pre-activity monitoring of the shutdown zones will commence.

- *Soft Start-* Soft-start procedures are believed to provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the impact hammer operating at full capacity. For impact pile driving, contractors will be required to provide an initial set of three strikes from the hammer at reduced energy, followed by a 30-second waiting period. This procedure will be conducted three times before impact pile driving begins. Soft start will be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of 30 minutes or longer.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, NMFS has determined that the mitigation measures provide the means effecting the least practicable impact on the affected species or stocks

and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the action area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas);
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;

- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and
- Mitigation and monitoring effectiveness.

Visual Monitoring

Marine mammal monitoring must be conducted in accordance with the Monitoring Plan and section 5 of the IHA. Marine mammal monitoring during pile driving and removal must be conducted by NMFS-approved PSOs in a manner consistent with the following:

- Independent PSOs (*i.e.*, not construction personnel) who have no other assigned tasks during monitoring periods must be used;
- At least one PSO must have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization.
- Other PSOs may substitute education (degree in biological science or related field) or training for experience;
- Where a team of three or more PSOs are required, a lead observer or monitoring coordinator must be designated. The lead observer must have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization; and
- The Navy must submit PSO Curriculum Vitae for approval by NMFS prior to the onset of pile driving.

PSOs must have the following additional qualifications:

- Ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;

- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

Up to four PSOs will be employed. PSO locations will provide an unobstructed view of all water within the shutdown zone, and as much of the Level A and Level B harassment zones as possible. PSO locations are as follows:

- (1) At the pile driving/removal site or best vantage point practicable to monitor the shutdown zones;
- (2) For activities with Level B harassment zones larger than 400 m two additional PSO locations will be used. One will be across from the project location along Inchon Road at Naval Amphibious Base Coronado; and
- (3) Two additional PSOs will be located in a small boat. The boat will conduct a pre-activity survey of the entire monitoring area prior to in-water construction. The boat will start from south of the project area (where potential marine mammal occurrence is lowest) and proceed to the north. When the boat arrives near the northern boundary of the Level B harassment zone (*e.g.*, just north of the western side of the Coronado Bridge as depicted in the Figures in the monitoring plan) it will set up station so the PSOs are best situated to detect any marine mammals that may approach from the

north. The two PSOs aboard will split monitoring duties in order to monitor a 360 degree sweep around the vessel with each PSO responsible for 180 degrees of observable area.

Monitoring will be conducted 30 minutes before, during, and 30 minutes after pile driving/removal activities. In addition, observers shall record all incidents of marine mammal occurrence, regardless of distance from activity, and shall document any behavioral reactions in concert with distance from piles being driven or removed. Pile driving activities include the time to install or remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving or drilling equipment is no more than 30 minutes.

Hydroacoustic Monitoring and Reporting

The Navy has volunteered to conduct hydroacoustic monitoring of all pile driving and removal methods. Data will be collected for a representative number of piles (three to five) for each installation or removal method. As part of the below-mentioned report, or in a separate report with the same timelines as above, the Navy will provide an acoustic monitoring report for this work. Hydroacoustic monitoring results can be used to adjust the size of the Level B harassment and monitoring zones after a request is made and approved by NMFS. The acoustic monitoring report must, at minimum, include the following:

- Hydrophone equipment and methods: recording device, sampling rate, distance (m) from the pile where recordings were made; depth of recording device(s);
- Type of pile being driven or removed, substrate type, method of driving or removal during recordings;
- For impact pile driving: Pulse duration and mean, median, and maximum sound levels (dB re: 1 μ Pa): SELcum, peak sound pressure level (SPLpeak), and single-strike sound exposure level (SELs-s);

- For vibratory removal and other non-impulsive sources: Mean, median, and maximum sound levels (dB re: 1 μ Pa): root mean square sound pressure level (SPLrms), SELcum; and
- Number of strikes (impact) or duration (vibratory or other non-impulsive sources) per pile measured, one-third octave band spectrum and power spectral density plot.

Reporting

A draft marine mammal monitoring report will be submitted to NMFS within 90 days after the completion of pile driving and removal activities, or 60 days prior to a requested date of issuance of any future IHAs for projects at the same location, whichever comes first. The report will include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets.

Specifically, the report must include:

- Dates and times (begin and end) of all marine mammal monitoring;
- Construction activities occurring during each daily observation period, including how many and what type of piles were driven or removed and by what method (*i.e.*, impact or vibratory and if other removal methods were used);
- Weather parameters and water conditions during each monitoring period (*e.g.*, wind speed, percent cover, visibility, sea state);
- The number of marine mammals observed, by species, relative to the pile location and if pile driving or removal was occurring at time of sighting;
- Age and sex class, if possible, of all marine mammals observed;
- PSO locations during marine mammal monitoring;
- Distances and bearings of each marine mammal observed to the pile being driven or removed for each sighting (if pile driving or removal was occurring at time of sighting);

- Description of any marine mammal behavior patterns during observation, including direction of travel and estimated time spent within the Level A and Level B harassment zones while the source was active;
- Number of individuals of each species (differentiated by month as appropriate) detected within the monitoring zone;
- Detailed information about any implementation of any mitigation triggered (*e.g.*, shutdowns and delays), a description of specific actions that ensued, and resulting behavior of the animal, if any; and
- Description of attempts to distinguish between the number of individual animals taken and the number of incidences of take, such as ability to track groups or individuals.

If no comments are received from NMFS within 30 days, the draft final report will constitute the final report. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments.

Reporting Injured or Dead Marine Mammals

In the event that personnel involved in the construction activities discover an injured or dead marine mammal, the Navy shall report the incident to the Office of Protected Resources (OPR), NMFS and to the regional stranding coordinator as soon as feasible. If the death or injury was clearly caused by the specified activity, the Navy must immediately cease the specified activities until NMFS is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the IHA. The IHA-holder must not resume their activities until notified by NMFS. The report must include the following information:

- Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
- Species identification (if known) or description of the animal(s) involved;

- Condition of the animal(s) (including carcass condition if the animal is dead);
- Observed behaviors of the animal(s), if alive;
- If available, photographs or video footage of the animal(s); and
- General circumstances under which the animal was discovered.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be “taken” through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS’s implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

Pile driving activities have the potential to disturb or displace marine mammals. Specifically, the project activities may result in take, in the form of Level B harassment

from underwater sounds generated from pile driving and removal. Potential takes could occur if individuals are present in the ensonified zone when these activities are underway.

The takes from Level B harassment would be due to potential behavioral disturbance, TTS, and PTS. No mortality is anticipated given the nature of the activity and measures designed to minimize the possibility of injury to marine mammals. The potential for harassment is minimized through the construction method and the implementation of the planned mitigation measures (see **Mitigation** section).

The nature of the pile driving project precludes the likelihood of serious injury or mortality. Take would occur within a limited, confined area (south-central San Diego Bay) of the stock's range. Level B harassment will be reduced to the level of least practicable adverse impact through use of mitigation measures described herein. Further the amount of take authorized is extremely small when compared to stock abundance.

Behavioral responses of marine mammals to pile driving at the project site, if any, are expected to be mild and temporary. Marine mammals within the Level B harassment zone may not show any visual cues they are disturbed by activities (as noted during modification to the Kodiak Ferry Dock (see 80 FR 60636, October 7, 2015) or could become alert, avoid the area, leave the area, or display other mild responses that are not observable such as changes in vocalization patterns. Given the short duration of noise-generating activities per day and that pile driving and removal would occur across six months, any harassment would be temporary. There are no other areas or times of known biological importance for any of the affected species.

In addition, it is unlikely that minor noise effects in a small, localized area of habitat would have any effect on the stocks' ability to recover. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activities will have only minor, short-term effects on individuals. The specified activities are not expected to

impact rates of recruitment or survival and will therefore not result in population-level impacts.

In summary and as described above, the following factors primarily support our determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No mortality or Level A harassment is anticipated or authorized;
- No important habitat areas have been identified within the project area;
- For all species, San Diego Bay is a very small and peripheral part of their range;
- The Navy would implement mitigation measures such as vibratory driving piles to the maximum extent practicable, soft-starts, and shut downs; and
- Monitoring reports from similar work in San Diego Bay have documented little to no effect on individuals of the same species impacted by the specified activities.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the monitoring and mitigation measures, NMFS finds that the total marine mammal take from the proposed activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under section 101(a)(5)(D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. When the predicted number of individuals to be taken is fewer than one third of the species or stock

abundance, the take is considered to be of small numbers. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

The amount of take NMFS authorizes is below one third of the estimated stock abundance of California sea lions (in fact, take of individuals is less than 1% of the abundance of the affected stock). This is likely a conservative estimate because they assume all takes are of different individual animals which is likely not the case. Some individuals may return multiple times in a day, but PSOs would count them as separate takes if they cannot be individually identified.

Based on the analysis contained herein of the proposed activity (including the mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our proposed action (*i.e.*, the issuance of an IHA) with respect to potential impacts on the human environment. This action is consistent with categories of activities identified in Categorical Exclusion B4 (IHAs with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality

of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has determined that the issuance of the IHA qualifies to be categorically excluded from further NEPA review.

Endangered Species Act

Section 7(a)(2) of the ESA (16 U.S.C. 1531 *et seq.*) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS consults internally, in this case with the West Coast Region Protected Resources Division Office, whenever we propose to authorize take for endangered or threatened species.

No incidental take of ESA-listed species is authorized or expected to result from this activity. Therefore, NMFS has determined that formal consultation under section 7 of the ESA is not required for this action.

Authorization

NMFS has issued an IHA to the Navy for the potential harassment of small numbers of one marine mammal species incidental to the Naval Base San Diego Pier 6 Replacement project in San Diego, CA, provided the previously mentioned mitigation, monitoring and reporting requirements are followed.

Dated: January 27, 2021.

Donna S. Wieting,

Director, Office of Protected Resources,

National Marine Fisheries Service.